

VI TELEFILTER**Filter specification****TFS 211 C****1/5****Measurement condition**

Ambient temperature:	20 ... 25 °C
Input power level:	5 ± 2 dBm
terminating impedances	
balanced input:	1,1 kΩ -5.1pF
balanced output:	1,1 kΩ -5.2pF

Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the TFS211C is the minimum of the pass band attenuation a_{min} . The minimum of the pass band attenuation a_{min} is defined as the insertion loss a_e . The centre frequency f_c is the arithmetic mean value of the upper and lower frequencies at the 1 dB filter attenuation level relative to the insertion loss a_e . The given values for the relative attenuation a_{rel} and for the group delay ripple have to be reached at the frequencies given below also if the centre frequency f_c is shifted due to the temperature coefficient of frequency TC_f in the operating temperature range and due to a production tolerance for the centre frequency f_c .

Data

		typ. value	limit
Insertion loss	$a_e = a_{min}$	6 ... 7 dB	min. 4,5 dB max. 8 dB
Nominal frequency	f_N	-	211 MHz
Centre frequency	f_c	211 MHz	
Relative attenuation	a_{rel}		
$f_N - 200$ kHz ... $f_N + 200$ kHz		0,5 dB	max. 1 dB
1 MHz ... $f_N - 1,8$ MHz		-	min. 30 dB
$f_N \pm 600$ kHz ... $f_N \pm 1,2$ MHz		-	min. 10 dB
$f_N \pm 1,2$ MHz ... $f_N \pm 1,8$ MHz		-	min. 20 dB
$f_N + 1,8$ MHz ... $f_N + 7,0$ MHz		-	min. 30 dB
$f_N + 7,0$ MHz ... 1,0 GHz		-	min. 45 dB
1,0 GHz ... 2,0 GHz		-	min. 40 dB
2,0 GHz ... 3,0 GHz		35 dB	
3,0 GHz ... 4,0 GHz		30 dB	
Group delay ripple GD			
$f_N - 200$ kHz ... $f_N + 200$ kHz	-	max.	max. 350 ns
Input power level		-	max. + 10 dBm
Permissible DC voltage		-	max. 10 V
Operating temperature range			- 35 °C ... + 85 °C 2)
Storage temperature range			- 35 °C ... + 85 °C
Temperature coefficient	TC	- 0,036 ppm/K ² 1)	
Frequency inversion temperature	T_0	25 °C	-

Note 1) - Δf (Hz) = TC (ppm/K²) x (T - T₀)² x F_{T0} (MHz)

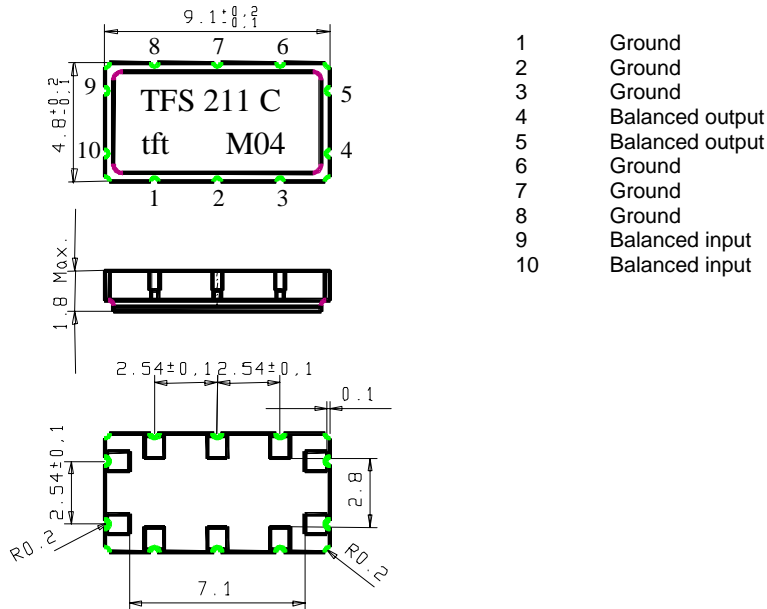
Note 2) If the filter is used between -10°C and -35°C all given frequencies may be changed down to max. - 30 kHz

Generated: _____**Checked / approved:** _____**VI TELEFILTER****Potsdamer Straße 18****D 14 513 TELTOW / Germany****Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30****E-Mail: tft@telefilter.com****Vectron International, Inc.****267 Lowell Road****Hudson, NH 03051 / USA****Tel: (603) 598-0070 Fax: (603) 598-0075****E-Mail: vti@vtinh.com**

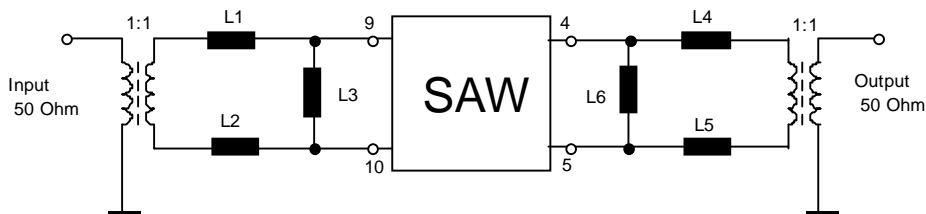
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Construction and pin connection

(All dimensions in mm)



50 Ω test circuit



VI TELEFILTER**Filter specification****TFS 211 C****3/5****Stability characteristics**

After the following tests the filter shall meet the whole specification:

1. Shock: 500g, 18 ms, half sine wave, 3 shocks each plane;
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 500 Hz, 0,35 mm or 5g respectively, 1 octave per min, 10 cycles per plan, 3 plans;
DIN IEC 68 T2 - 6
3. Damp heat: 25 °C to 55°C / 95% r.H. / 10 cycles
(cycle) DIN IEC 68 - 2 – 30 Db
4. Resistance to solder heat (reflow): max. 2 times reflow process;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

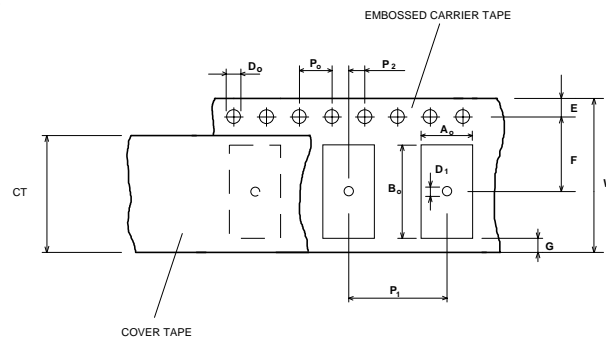
Packing

Tape & Reel: IEC 286 - 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

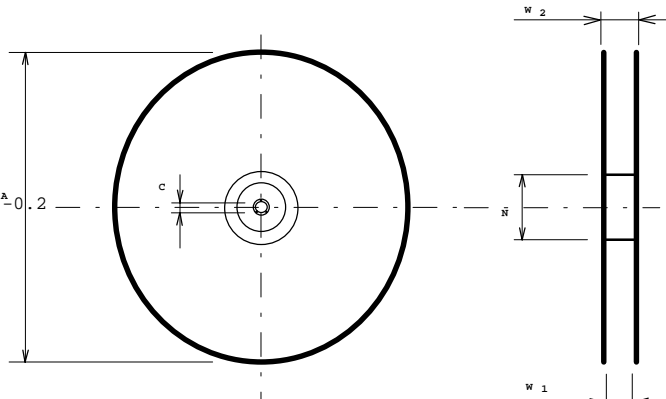
max. pieces of filters per reel: 3000
Reel of empty components at start: min 300 mm
Reel of empty components at start including leader: min 500 mm
Trailer: min 300 mm

Tape (all dimensions in mm)

W	: 16 ± 0,3
Po	: 4 ± 0,1
Do	: 1,5 + 0,1
E	: 1,75 ± 0,1
F	: 7,5 ± 0,1
G (min)	: 0,60
P2	: 2 ± 0,1
P1	: 8 ± 0,1
D1(min)	: 1,5
Ao	: 5,30 ± 0,2
Bo	: 9,70 ± 0,2
CT	: 13,5 ± 0,1

**Reel (all dimensions in mm):**

A	:	330
W1	:	16,40 +2,0
W2 (max)	:	22,4
N (min)	:	50
C	:	13,0 ± 0,5 / ^A 0,2



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. The marking of the filters is able to read if the view is directed on the upper side of the carrier tape with the sprocket holes on the right side of the tape.

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Air reflow temperature conditions

1st and 2nd air reflow profile

Name:	pre-heating periods	main-heating periods	peak temperature
Temperature:	150 °C - 170 °C	over 200 °C	255 °C ± 5 °C
Time:	60 sec. - 90 sec.	20 sec. - 25 sec.	

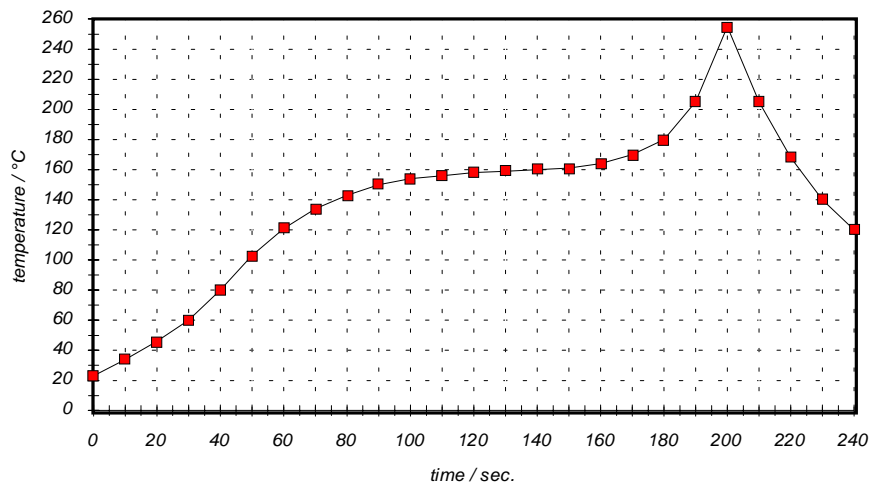
Chip-mount air reflow profile

Table for temperature vs. time during the air reflow process

Tolerance of temperatures: ± 5 °C

time / sec.	temperature / °C	time / sec.	temperature / °C
0	23	140	160
10	34	150	161
20	46	160	164
30	60	170	170
40	80	180	180
50	103	190	205
60	121	195	230
70	134	200	255
80	143	205	230
90	150	210	205
100	154	215	180
110	156	220	165
120	158	230	140
130	159	240	120

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History

Version	Reason of Changes	Name	Date
2.0	generate detailed specification - add terminating impedances - add matching circuit - add tape and reel dimensions, stability characteristics and reflow profile	Steiner	24.01.2001

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